# Phase-1

**Student Name:** Keerthika T

**Register Number:** 410723106018

**Institution:** Dhanalakshmi College of Engineering

**Department:** Electronics and Communication Engineering

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## Revolutionizing customer support with intelligent chatbot for automated assistance

### 1.Problem Statement

In today's fast-paced digital era, customers expect quick and efficient support. Traditional customer service models often struggle to handle high volumes of queries, leading to long wait times, reduced customer satisfaction, and increased operational costs. This project aims to solve the inefficiencies in customer support systems by developing an intelligent chatbot that can automate responses, provide 24/7 assistance, and improve the overall customer experience.

### 2.Objectives of the Project

•Develop an AI-powered chatbot capable of understanding and responding to customer queries automatically.

•Reduce human workload by handling repetitive and frequently asked questions.

•Enhance customer satisfaction by providing instant and accurate responses.

•Continuously learn and improve the chatbot's knowledge base using feedback and data.

## 3.Scope of the Project

**Features:**

•Natural Language Understanding (NLU) to interpret customer queries.

•Pre-trained models for intent recognition and response generation.

•Integration with a sample customer support platform (optional demo).

## 4.Data Sources

**Dataset:**

•Public datasets from Kaggle such as "Customer Support on Twitter" and FAQs data.

•Synthetic datasets created for specific intents and responses.

**Type:**

•Public and synthetically generated.

**Nature:**

•Static for initial training, with scope for dynamic updates in future versions.

## 5.High-Level Methodology

- **Data Collection** – Download public customer support datasets and manually create additional FAQ data.

- **Data Cleaning** – Remove duplicates, fill missing values, and normalize text (lowercasing, removing special characters).

- **Exploratory Data Analysis (EDA)** – Analyze common customer intents, question types, and frequently asked topics.

- **Feature Engineering** – Text tokenization, stop-word removal, and vectorization (TF-IDF or word embeddings).

- **Model Building** – Experiment with models like Decision Trees, Random Forests, and fine-tuned Transformer-based models (e.g., BERT).

- **Model Evaluation** – Use metrics such as Accuracy, Precision, Recall, F1-Score, and Confusion Matrix.

- **Visualization & Interpretation** – Use Seaborn and Matplotlib to visualize model pe applicable rformance and EDA insights.

- **Deployment** – Deploy using a simple Streamlit or Flask app showcasing chatbot interaction.

## 6.Tools and Technologies

- **Programming Language** – Python

- **Notebook/IDE** – Google Colab / Jupyter Notebook

- **Libraries** – Data Processing: Pandas, NumPy
  Visualization: Matplotlib, Seaborn
  Modeling: Scikit-learn, TensorFlow, Hugging Face Transformers
  NLP Tools: NLTK, spaCy

- **Optional Tools for Deployment** – Streamlit, Flask

## 7.Team Members and Roles

| S NO | NAME | ROLE | RESPONSIBILITY |
|------|------|------|----------------|
| 1. | Sweetha Mirra A | Member | Model building, Model evaluation |
| 2. | Sharmila S | Member | Feature Engineering |

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| 3. | Sowmiya M | Member | Exploratory Data analysis |
| 4. | Keerthika T | Member | Visualization |
| 5. | Yuvasri B | Leader | Data collection and Data cleaning |